

Remarks:

Claim 41-49, 51-64, 66-82, and 84-95 remain for consideration in this application. Of these claims, claims 41, 53, 71, 89-95 are in independent format.

Turning now to the office action, it is noted with appreciation that the Examiner has found all rejections from the last office action to be overcome. The Examiner did, however, locate a further reference and has raised rejections based upon that reference. Specifically, the Examiner has rejected claims 41-43, 48-49, 51-53, 55, 57-59, 63-71, 73, 75-77, 81-82, 84-92, and 94-95 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Publication No. 2005/0031964 to Babich et al. The Examiner also rejected claims 54, 56, 72, 74, and 93 under 35 U.S.C. 103(a) as being unpatentable over the Babich et al. reference.

The Babich et al. reference has a filing date of August 5, 2003. Applicants have attached to this Amendment a Declaration under 37 C.F.R. §1.131 showing that the Applicants reduced the claimed invention to practice in the United States prior to August 5, 2003. The Declaration is signed by Dr. Jim D. Meador, one of the inventors named on the above-referenced patent application. Exhibits A and B show: the preparation of a composition within the scope of composition claims 41-49, 51-52, 89, and 95; a structure within the scope of claims 53-64, 66-70, and 90-91; and a method within the scope of claims 71-82, 84-88, and 92-94. The dates on these Exhibits have been blocked out, but Dr. Meador declares that those dates are earlier than August 5, 2003.

The Declaration provides a detailed explanation of where each limitation of each independent claim can be found in the accompanying Exhibits. To summarize, Exhibit A describes the preparation of a polyhedral oligomeric silsesquioxane ("POSS") with an alcohol functionality. The


POSS was used to prepare a composition by dissolving or dispersing the POSS in a solvent system. The composition also included an aminoplast cross-linking agent, catalyst (which is also a strong acid), and a weak acid.

Exhibits A and B also show how the composition was spin-coated onto a substrate to form a layer. Exhibit B shows the processing conditions (spin speeds, curing conditions, film thicknesses, and exposure and developments steps) used to form a layer of the composition on a substrate, to apply a photoresist to that composition layer, and to pattern the photoresist.

It is respectfully submitted that the above argument, along with the detailed explanation provided in the attached Declaration by Dr. Meador (and accompanying exhibits), shows possession of the claimed invention prior to the filing date of the Babich et al. reference. Thus, the Babich et al. reference is not available as prior art against the presently pending claims because the Babich et al. application was not filed prior to the invention of the claimed invention by the Applicants.

The Examiner raised no further rejections and cited no further references in this office action. Therefore, a Notice of Allowance appears to be in order. Any additional fee due in conjunction with this amendment should be applied against our Deposit Account No. 19-0522.

Respectfully submitted,

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ATTORNEYS FOR APPLICANT(S)

PROJECT

Copolymerization Methyl Methacrylate  
- POSS and Hydroxypropyl Methacrylate

Continued From Page

MAO717, Methyl Methacrylate, POSS is soluble in PGMEA at ambient conditions

A 100 ml three-necked flask equipped with magnetic stirring bar, thermometer, nitrogen inlet, and condenser with nitrogen outlet was charged with 4.00g (0.00535 mmol) of MAO717, 2.67g (0.00535 mmol) of hydroxypropyl methacrylate (26.9543-1L), 60.7g (0.00535 mmol) of AIBN (44.109-0).

The mixture was flushed with nitrogen at ambient conditions from 11:13 AM Wed. to 11:20 AM Wed. and the flask then immersed in an oil bath at 65°C. The mixture was stirred under nitrogen. Soln temp 60°C at 11:45 AM Wednesday. Soln temp 62°C at 11:57 AM Wed. Soln temp 62°C at 12:10 PM Wednesday. Soln temp 61°C at 1:00 PM Wed. Soln temp 61.5°C at 1:24 PM Wed. Soln temp 63°C at 3:32 PM Wed. Soln temp 61.5°C at 4:55 PM Wed. Soln temp 61°C at 8:07 AM Thursday. Soln temp 62°C at 11:10 AM Thursday. Soln temp 60.5°C at 11:55 AM. Then and with the nitrogen still flowing the flask was removed from the oil bath. With the solution temperature at 26.5°C, 17.1 mg of 4-methoxyphenol (M1, 963-5) was added. The mixture was stirred from 12:34 PM to 1:04 PM 30 min. On adding a drop of the solution to methyl alcohol (M1239), a precipitate was not observed which was ~~observed~~ <sup>ONINOS</sup> ~~observed~~. One titration yield of product = 66.55g. This was a very small amount of insoluble in the solution. When adding a drop of the M-L to solution (179418) still observed no precipitate.

Order of Charge Recipe

3	MAO717	4.00g	[1.20g of silicon]
1	hydroxypropyl methacrylate	2.67g	
2	PGMEA	60.7g	
4	AIBN	66.6mg	[55.2mg insoluble material]
		67.43g	Theoretical Yield

Percent silicon in the polymer =  $1.20 / 67.25 \times 100 = 1.78\%$

After adding the 4-methoxyphenol theoretical yield is 67.43g.  $\therefore 0.2146$  mmol hydroxypropyl.

9.97% polymer solid

24 hr at 60.5-63°C

Read and Understood By

Gen D. Meador

Signed

Date

Signed

Date

The polymer sol. J172444-43 is soluble in tetrahydrofuran.  
Continued on Page  
Mw was 55,700  
Mn was 20,200  
D was 2.76

EXHIBIT  
A

Preparation of an EML from  
JM2404-43

Notebook No. 2404

Continued From Page

A 250 ml Nalgene bottle was charged with the following ingredients in the stated order and the mixture stirred to homogeneity at ambient conditions.

(M-L) JM2404-43 30.0g [2.99% polymer, 8.238 mg hydroxyl, 27% PGMEA]  
PGMEA 89.8g  
PWL (LI 3/24/03) 0.886g [8.24 mg]  $\text{M.L. \% PWL} = \frac{0.886g}{0.886g + 2.7g} \times 100 = 24.86\%$   
A-TSA-H<sub>2</sub>O (40, 288-5) 36.5g  
bisphenol S [10, 303-7] 110.8g  
120.83g [3.33%]

The homogeneous solution was taken off the magnetic stirring plate on Friday afternoon. Rather than deaerating the solution was taken directly to the clean room. A spin at 1500 rpm for 60 sec, followed by a cure at 205°C / 60 sec, was given. 669.7A. A small amount of smoke was given off during the bake. Ethyl acetate strip was +0.59%. Polymerization did occur!

About 16.15, the EML was deaerated by tumbling with 5.8g of PGME-washed 650C beads from 11:31 AM Monday to 3:27 PM Monday (4 hr). The beads were removed by straining thru 2 layers of plastic cloth. The EML was then twice filtered thru a 0.1µm end-port into 125 ml Nalgene bottles.

Continued on Page

Read and Understood By

Joni D. Meador

Signed

Date

Signed

Date

HML JM2404-44 on ARC29A with GARS8107A10:  
Processing Conditions

-2-

ARC29A-8

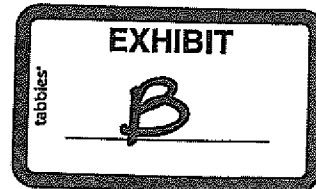
Bake: 205 °C/60 sec.  
Thickness: 77 nm

EML JM2404-44

Coating: 1250 rpm/60 sec.  
Bake: 205 °C/60 sec.  
Thickness: 73.6 nm \*

\* BSI data

Resist: GARS8107A10  
Modified acrylate, dense lines  
Dispense: Manual  
SB: 115°C/90 sec.  
Thickness 200 nm  
Exposure Tool:  
ASML 5500/1100,  
NA 0.75, \_ 0.89/0.55  
Dipole illumination  
Mask: TM99LF 9%attPSM  
E 16.0+0.5 mJ/cm<sup>2</sup>  
F 0.0+0.1  
FEM E15xF15  
PEB: 110°C/90 sec.  
Develop.: OPD262-LD60 sec.



Mariya Nagatkina

Reference to IMEC is obligatory for representations



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